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## ARRESTED MENTATION.

I DESIRE to call the attention of my readers to a psychological phenomenon, which is little known. The name by which I have designated it, may appear perhaps somewhat vague, but the considerations which I intend to advance, will, I hope, throw some light on it.

Neither the mind nor the senses of man serve him with absolute perfection. The eye often plays us false in reproducing the things and the phenomena of the outer world. For example, it shows us the moon as a small, luminous ball, whilst we know in reality that it is an immense body of matter revolving in space. We seem to see the sun revolving around the earth, though the contrary is an undoubted fact. In short, if the organ of vision be the source of a great part of our knowledge, it is also the source of a vast number of errors and wrong perceptions, which give rise to erroneous judgments or render exact judgments very difficult.

It is the same with the mind. The mind acts according to certain laws which lead us, according to circumstances, to truth, or to error. Error is sometimes the normal result of human reasoning and of the regular functioning of the mind according to the general laws of its activity. In such cases Truth is the exception. It is a perfected result which man has arrived at in his judgments by the correction of false conclusions, in the same manner that he indirectly corrects the false perceptions of his senses. Psychology hitherto has given little attention to the investigation of these organic defects of the human intellect, although it is the only study that furnishes us the key to a vast number of superstitions, errors, aberrations, and absurd beliefs prevalent in the human race.

Logic, as formulated by Aristotle and John Stuart Mill, is far from supplying the natural laws which govern mental action ; it sets forth instead, ideal rules, which, if closely followed, would in the end no doubt lead men to the discovery of the truth. Logicians like Aristotle and Stuart Mill study and analyse the corrective methods which lead our thought to the truth when the normal laws would lead it to error ; they point out how man *ought* to think in order to discover the truth, but they do not show how he actually does think in the majority of cases, in seeking to control his sentiments and conduct.

We are aware that one of the most important actions of the mind is that by which we arrive at the causes of phenomena. We also know that the idea of cause implies no other idea but that of a constant relation of succession between two facts ; to that second phenomenon which always follows the first phenomenon called *cause*, we give the name of *effect*. Let us now examine how the process of reasoning by which we discover causes differs, in the ideal logic of Aristotle and Stuart Mill, from the real logic which is commonly in use among men.

Let us take, for example, that method of discovering causes which Stuart Mill calls "the method of agreement." "Let *a* be the effect," writes Mill. "Here we have only the resource of observation without experiment ; we cannot take a phenomenon of which we know not the origin and try to find its mode of production by producing it ; if we succeeded in such a random trial, it could only be by accident. But if we can observe *a* in two different combinations *abc* and *ade*, and if we know or can discover that the antecedent circumstances in these cases were *ABC* and *ADE*, we may conclude that *A* is the antecedent connected with the consequent *a* by a law of causation. *B* and *C*, we may say, cannot be causes of *a*, since on its second occurrence they were not present ; nor are *D* and *E*, for they were not present on its first occurrence. *A*, alone of the five circumstances, was found among the antecedents of *a* in both instances. For example, let the effect *a* be crystallisation. We compare instances in which bodies are known to assume crystalline structure, but which have no other point of agree-

ment ; and we find them to have one, and as far as we can observe, only one, antecedent in common : the deposition of a solid matter from a liquid state, either a state of fusion or of solution. We conclude, therefore, that the solidification of a substance from a liquid state is an inevitable antecedent of its crystallisation.”<sup>1</sup>

Such, according to John Stuart Mill, is the mental process employed in the discovery of the causes of phenomena. It consists in a rigorous and accurate examination of the facts which precede the phenomenon of which we seek the cause, upon the basis of which we extricate the facts which precede always and invariably, from those which occur only occasionally and by accident.

Note, however, that we are concerned here with that scientific, attentive, and exact mode of reasoning, in which man strives by unusual effort to guard himself against every possible chance of error, and not at all with the method that is employed by the vast majority of mankind. Scientific reasoning demands the exercise of attention. To put forth the severe mental effort there demanded, would be impossible for all men, in every act of thought. It is true that the capacity for attention is greater among civilised nations than among savages, but even with the former the average is not very high. The use of this faculty sooner or later brings with it such a sense of exhaustion and fatigue as to cause men to husband their mental effort or to bestow their attention only on those things which interest them very strongly. “Very few,” writes M. Ribot, “are those to whom attention is a necessity, and still fewer they who choose the *stantem oportet mori*.”

As a matter of fact, only a few of our ideas are the outcome of voluntary reflexion and concentrated attention ; the remainder are the product of associations which have been established unconsciously and gradually in our brains as the result of impressions from the things and phenomena of the surrounding world. Observe how the savage nations, incapable as they are, both of sustained attention and reflexion, have made practical use of so many of the forces of nature, without possessing even the most rudimentary

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<sup>1</sup>J. S. Mill. *A System of Logic*. London, 1875. Vol. I., p. 469

knowledge of physics or chemistry. "If we mistake not," writes M. Espinas, "it would puzzle very seriously some of our scientific men to give the mechanical theory of the *boomerang*, that weapon which after having attained its aim returns to the person who threw it. It has taken long and continuous study to explain theoretically the chemical processes practised from time immemorial in the preparation of metals and in the productions of the wine press, the dairy, etc. Horticulture came before botany; and it was from the stock-breeders that Darwin borrowed his idea of natural selection—not they from him. In all ages practice has preceded theory. In other words, action has in all ages adapted itself to circumstances without the assistance of abstract thought." To-day even, by a simple glance at the atmosphere, the sailor unfailingly discovers the signs of fair or foul weather. The sportsman often knows more about the psychology of the horse than ever Mr. Romanes or M. Houseau, though neither have made any profound study of meteorology or psychology. The proverbs of nations, which are a compendium of the national experience and wisdom, often contain truths that have cost science years of laborious research to establish. M. Lombroso and I found epitomised in proverbs the fact of the greater longevity of woman, a law which it took statistics a long time to establish scientifically by tables and figures.

This particular species of reasoning, which we may call with M. Espinas *subconscious*, and in which neither attention nor reflexion has much share, has always been employed by men on a much larger scale than scientific reasoning, properly so called. It is based on the law of association. Spencer has demonstrated that the associability of certain states of consciousness is in proportion to the frequency with which they follow each other in experience. How, then, do we arrive in this subconscious form of reasoning at the discovery of the causes of facts? Let us suppose a case. The appearance of phenomenon *a* is sometimes preceded by the phenomena *ABC*, sometimes by *ADE*, at other times by *AFG*; and in all the series of phenomena preceding *a*, the presence of *A* is always noted; that is to say, in the experience of individuals, *A* is three times associated with *a*, whilst *BCDE* and so forth are only asso-

ciated with it once. It follows according to the law enunciated that the idea of *a* tends to recall the idea of the cause *A*, far more strongly than it does that of *BCD* and so forth, because of having been associated with *A* a greater number of times than with the others. Farmers know perfectly well that rain is more necessary to good crops than either wind or moonlight. Having noticed from generation to generation that certain atmospheric changes, such as rain, wind, or a long stretch of clear nights produce different effects, little by little a train of ideas has been unconsciously established in the brain, associating rain with fruitful harvests. In this way they come to the knowledge of the fact that rain is a cause of vegetation and that moonlight is not.

The law of mental associations, acting alone and independently of attention, has given to man the knowledge necessary for life ;—a knowledge of innumerable facts and countless natural phenomena that science only subsequently explained.

It cannot be denied that this is the commonest form of reasoning ; for science, being still a recent product, is as yet only the privilege of a very few. Moreover, subconscious reasoning is undoubtedly much less fatiguing than the other mode, which involves the fullest consciousness and attention. Now, since man, by the law of least effort, about which I have spoken in another place,<sup>1</sup> always puts forth in his work the least possible intellectual exertion, subconscious reasoning ought naturally to be preferred before the others. However, if left uncorrected by attention and reflexion, unconscious reasoning does not always lead man to the truth ; for in certain cases error is the normal and regular issue of this form of reasoning.

Now, one of these laws of subconscious reasoning is that which I call *arrested mentation*. By it in certain cases the thought of man is led in its search for causes to commit a species of error which is the source of many of the false notions of primitive races, and is to-day even the occasion of many fallacies which pass as accepted truths.

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<sup>1</sup>See *Revue philosophique*, "L'inertie mentale et la loi du moindre effort," February, 1894.

Let us suppose that the phenomenon  $a$  is always preceded by the phenomenon  $A$ , and that  $A$  is always preceded by  $B$ . The ulterior cause of  $a$ , then, is  $B$ ; and the scientist investigating  $a$ , would not stop at  $A$ , but would push on his researches to  $B$ . Let us suppose, further, that  $A$  is of such a nature as to be apprehended by the senses, say of sight and hearing, and that  $B$  cannot be perceived by the senses, but is invisible, intangible, etc.; it follows that  $B$  produces no sensations, and although it is necessary for the production of  $a$ , still its presence cannot be detected except by attentive observation, comparison, reflexion, and analysis of facts; that is, by the employment of one of Mill's four methods for the discovery of causes. Now, subconscious reasoning is carried on by the association of states of consciousness produced in our minds by *sensations*; and  $B$  not producing sensations will be excluded from the associative series. In other words, in this mode of reasoning  $A$  will be considered as the ulterior cause of  $a$ , and  $B$  will remain utterly ignored. The train of thought is arrested at  $A$ ; that is to say, it stops short at facts falling under the notice of the senses.

This theory well explains the genesis of a vast number of erroneous notions universally accepted as truths by primitive peoples, and sanctioned also by civilised persons ignorant of science or scientific methods. Some of the tribes in Australia have been known to pray to the white man's gun not to shoot them, for they believed it was the gun itself, without the co-operation of man, that produced the murderous fire. Certain barbarous tribes entertain an absolute veneration for the art of writing. The North American Indians believe a written paper cannot lie, and they regard a letter of recommendation as a great prize, purely for its own sake and not at all for its contents. The blacks in Congo believe that paper and writing are spirits capable of speech, and whenever a European sends a letter by a native to any one, if the latter should loiter or stop to amuse himself by the way, he never fails to hide it under a stone, for fear it should reveal his delinquency to either the sender or the recipient. In Annam the French unwittingly provoked a rising of the natives by tearing up some written papers which were regarded as sacred by them.

Whence comes this exaggerated importance accorded by savage man to the fire-arms and handwriting of the Europeans? It is the result of the psychological phenomenon named by me arrested mentation. The savages observe that the European, by looking at certain signs and figures traced on a sheet of paper, is put in possession of the thoughts or the commands of another person, dwelling a great distance off, perhaps hundreds of miles away. This fact fills him with such astonishment that he is capable of but two sensations or impressions. He perceives that the reader has grasped the ideas of the other person, and that this fact happened after the signs on the paper had been scrutinised. These two events occurring always in succession become coupled together in his brain, and he concludes that it was the paper that spoke and revealed the thoughts of the absent person. He can neither estimate nor understand the whole complex series of associations connecting the written signs with their representative sounds, which is the essence of written language, and the vehicle by which we convey our thoughts to others. In order to understand this, the savage would have to possess the requisite knowledge of the importance and meaning of writing and the part those signs and images play in expressing and conveying thought. He cannot do this, but simply falls back upon the impressions caused by the writing and the effect it had on the reader. He connects these two facts and attributes to the paper what in reality is only the effect of a series of very complex associations established in our brains between the sight of certain signs and the images of certain sounds; and he finally concludes that a written paper is something supernatural and endowed with mysterious powers. It is the same with fire-arms, for the savage mind has great difficulty in understanding their mechanism.

Now is this error in the search for causes confined solely to uncivilised man? No. On the contrary it is to be met with in all the reasoning of those, who, though civilised, have not had the advantages of a higher education—in fine, in the reasonings of the great mass of the people. Let us glance for a moment at the legends connected with books. The common people, when they find any one with more than the usual amount of education and apparently better



informed than his fellows, always attribute this mental superiority to the possession of books, from which this greater knowledge has been acquired. According to the Chinese popular belief, Fo-Hi, a saint and legislator, saw the laws which he gave his people, written on the back of a serpent. In the Koran this theory of the book applied to superior men is very noticeable. God sends a book from Heaven in which His will is found written—the Pentateuch, the Gospel, the Koran. Thus we read (Book VI., Verse 19): “Every age has its book;” (Book XIX., Verse 13) “the prophets have theirs.” God says to John the Baptist (Book XIX., Verse 31): “Take this book (the Pentateuch);” and the new born Jesus says to the family of His mother: “I am sent by God, He has given me His book.” “O true believer,” cries the prophet (Book IV., Verse 135), “believe in God, and in his apostle, believe in the book which He has sent and in the Scriptures that descended to earth before him.”

This superstition about books is clearly explained by the theory of arrested mentation. The average man observes that persons of high mental attainments, physicians, lawyers, and others, possess a great many books which they often read. These, as well as all other distinguishing marks of the educated man, such as learned speeches, etc., are the only tangible evidence which his senses impart to him of their superior knowledge. Accordingly, he puts the two ideas together and comes to the conclusion that it is the book that has made the scholar. Here also the reasoning has stopped half way, for books are merely the means of communicating ideas, while in order to be a superior man, one must be able to create ideas. Nothing of all this, however, enters into the associations of the average man, who is limited to the reports of his senses for his knowledge. Accordingly, he concludes that it is through the possession of books and not by the power of genius that the learned man has become the superior of his fellows.

Arrested mentation explains also that exaggerated respect which man has always had for the instruments that assist him in his struggle for existence, attributing to them the success of his labors, whilst

in reality that success depends as much on the ability of the man who wields the instrument as on the instrument itself.

Generally speaking the military power of countries is gauged by the number of horses, guns, cannons, and soldiers which each possesses, without taking into consideration that soldiers and weapons are merely instruments which can be made use of only if well handled, and that their number is subordinate to their effective use ; for in the hands of a bad marksman a Remington even, may be less dangerous than the arrow of the savage. Here again arrested mentation comes into play.

It will be remembered that in the early days of the introduction of machinery into manufactories, riots broke out among the mill-hands. The reduction of wages and of labor was attributed to the use of these machines. But this was really caused by certain complications in the social economy of the time and was not at all the result of the introduction of machines. The working-classes, however, observing that these troubles always fell upon them immediately after the introduction of the machines, associated those two facts of which they had immediate knowledge and declared that the use of machinery was the immediate cause of reduced wages and scarcity of work, being ignorant of those economical complications which were the real though invisible causes of their distresses and which could only be discovered by dint of reflexion and a careful analysis of facts. Here again we have a case of arrested mentation.

A similar delusion existed in olden times with regard to gold and is still to be met with to-day among people ignorant of the principles of political economy. Gold in the opinion of such persons was wealth, while in reality it is merely the means whereby we estimate wealth, the actual source of which is labor. It was observed that those who possessed much gold were able to procure everything they desired. These two facts given by the immediate experience of the senses became associated in the minds of the greater portion of mankind, who never took into consideration the fact that all the precious metals in the world would be practically useless if nobody took the trouble to produce by means of labor the wealth which is measured in exchange by gold. The economic relations between

money, wealth, and production can only be understood by abstract thought, and for this reason, they are neglected in subconscious ratiocination. Thus, Spain in the sixteenth century based her whole system of political economy on the acquisition of gold and on idleness ; while she thought to enrich herself without exertion, she found herself in a very short time reduced to poverty.

Arrested mentation then is a real law of the mind, and a positive one, so to speak, for we have seen that it plays a most important part in much of human reasoning. Since it is this subconscious form of reasoning rather than the scientific form that is more commonly used, the preceding reflexions assume the status of a psychological law asserting that in the analysis of a series of phenomena with which another phenomenon is connected by a law of causality, human thought is arrested at the phenomena which produce the sensations and which are revealed directly to the senses, and neglects those that can only be discovered by reflexion and comparison. It is a defect of the mind, an organic defect, which logic seeks to remedy by a study of the methods of avoiding false conclusions.

So true is this that even scientific thinkers are occasionally subject to arrested mentation with regard to phenomena which are not the subject of their habitual researches. An eminent chemist still believes that gold is the wealth of nations ; a social economist thinks that the military power of a government is augmented by the increased number of guns and of forts. In Italy men of science attribute the inferiority of Italian scientific discoveries to the poverty of the laboratories and the inefficiency of their instruments, failing to perceive that a genius can make great discoveries even without possessing very perfect or numerous instruments. For, to quote the words of a German naturalist about the microscope—"It is the eye and the brain of the scientist that makes the discovery, not the microscope."

Here we perceive the possibility of a new science—positive logic—which would make a study of the laws of human reason, according to age, the degree of intellectual development, and the state of civilisation. It is not true that logic is always one and the same ; it varies, like all other human things, according to the age,

the degree of intelligence, and the development of the brain. As it is a brain-function, it follows the variations of that organ. A child, a savage, makes use of modes of reasoning very different from those of an advanced thinker. The brain of a child or of a savage differs sensibly from the brain of a Newton or a Darwin. In the logic of Stuart Mill or Aristotle the *post hoc ergo propter hoc* is a heresy, yet it is the normal method used by children, savages, and the lower classes even to-day. It is said of Stephenson, that while watching one of his own trains carried along by a locomotive, he exclaimed : "It is the sun that moves all that." But if it is quite natural that a scientific man like Stephenson should perceive the sun to be the last cause of the motions of trains, it is also normal and in the regular order of things that an ordinary man with but little instruction should attribute that motion to the engine preceding the cars. The reasoning of the one stops short at this point, while the mind of the other, embracing an immense number of facts, links them all together into a marvellous synthesis.

I have examined but one law of this positive logic, the law of arrested mentation, but I do not doubt that in extending our researches we could find many more. We do not yet understand the mode of reasoning of the savage, of the average civilised man, or of the child ; this is why so many ideas, superstitions, beliefs, usages, and customs astonish us and appear so inexplicable, while the key to all of them might be found in a complete psychology of human reasoning.

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In this species of arrested mentation observation stops half way; it is arrested at the facts which fall under the notice of the senses. But arrested mentation can occur in still another way, involving the total abolition of observation.

As is known, one of the gravest faults of the mind has always been a penchant for the exclusive use of pure logic and deductive reasoning. In this century of experimental science, nothing appears more simple and elementary than the study of the phenomena of nature and its laws by observing facts and drawing conclusions from observation. This procedure appears so natural that it seems

impossible to believe that any one could have ever supposed he could make the acquaintance of the facts of nature in any other way. But the history of science shows that the method of observation and the method of experiment were difficult conquests and only recently completely mastered. Formerly nothing was employed but pure reason without the slightest observation of facts; logic usurped the place of experiment, and all science began by the use of the deductive method. As Lange has remarked, even the materialistic schools, the very nature of whose studies kept them in close contact with nature, reasoned in this way. Physics and chemistry in their early days consisted merely of a series of deductions drawn by the aid of logic from a principle which was the fruit of some real or imaginary observation; and it was only later that men began to perceive that in order to understand natural laws correctly they must observe more and reason less. In fact, logic, which in the method of experiment and observation is only the psychological instrument with which we work upon facts in order to discover truth, the crucible by which we extract from the ore of observation the gold of truth,—this same logic was in the origin of science the source of truth, the philosopher's stone which could create gold. Now, I maintain that this abuse of deduction is the result of arrested mentation produced by definite causes; that it is a lower form of human reasoning, like the species of arrested mentation studied above—all of which would explain the commonness and diffusion of its use.

The form of arrested mentation which we have just been considering was due to the tendency in man to escape from the effort of attention and conscious thought. He prefers to use the subconscious form, which is not so severe a tax on his brain. I have elsewhere attempted to demonstrate that the mind always seeks to employ the psychological processes which demand the least expenditure of mental labor and are the least fatiguing. This I have called *the law of least effort*. All labor involves a waste of tissues, and it becomes painful in proportion to their weakness. Now, brain-work appears to create a sense of discomfort in the great majority of men who seek to reduce as much as possible the intensity of it by putting forth always the least possible effort. Keeping this

in mind, we can easily understand why the *à priori* method is generally preferred to the *à posteriori*, with its experimental and practical observations; it is because the former mental operation is far more simple and less fatiguing than the latter, and involves less complex and multitudinous elements. In order to deduce a definite conclusion or law from the observation of a large number of facts, the mind must keep before it the images or ideas of all those facts, also the idea of their differences and their resemblances (which presupposes very complex relations between the ideas of the facts); further, for all or for many of the facts the idea of the conditions under which they are produced, and the idea of their relations with other conditions in which they are not produced. We see then that the mental operation by which we arrive at a definite conclusion if it starts from a positive observation of facts, is extremely complex and always implies the presence in the mind of a considerable number of elements.

But to draw a conclusion from a premise requires simply a syllogism, that is to say, a mere chain of ideas, from which are excluded all those collateral associations which constitute the complexity of the first form of reasoning. We need only keep clearly in mind the premises from which we draw a conclusion; consequently, the number of the states of consciousness are enormously lessened, even supposing these conclusions to become in their turn premises from which ulterior conclusions are drawn, for there are never more than two states of consciousness present to the mind, while the first even may be forgotten, as soon as its conclusion begins to assume the rôle of the premise to some final conclusion. In short, the advantage in favor of purely deductive reasoning is this, that there is no need to keep present to the mind anything except the premise and the conclusion, whilst in the other form we must grasp an infinity of ideas, with their perplexing relationships, as facts forming the basis of the conclusion, and these oftentimes are exceedingly numerous and diverse.

To give a rough idea of the widely different complexity of the two modes of reasoning, I will offer here a sketch of the states of consciousness which are present in both.

If we call  $a, b, c, \dots z$  the states of consciousness produced by the observation of the facts,  $+a', +a'',$  etc., and  $+b', +b'',$  etc., the ideas of the conditions under which  $a, b, c,$  etc. respectively present themselves;  $-a', -a'',$  and  $-b', -b'',$  the ideas of the conditions under which they do not present themselves; if we call, further,  $+\alpha, +\beta, +\gamma,$  the ideas of the resemblances, and  $-\alpha, -\beta, -\gamma,$  the idea of the differences between  $a, b, c,$  the following table will perhaps give some notion of the complexity of the mental operation:

$$\begin{array}{cccc}
 \underbrace{-a' - a'' - a''' \dots - a^n}_{a} & \underbrace{-b' - b'' - b''' \dots - b^n}_{b} & \underbrace{-c' - c'' - c''' \dots - c^n}_{c} & \underbrace{-z' - z'' - z''' \dots - z^n}_{z} \\
 \underbrace{+a' + a'' + a''' \dots + a^n} & \underbrace{+b' + b'' + b''' \dots + b^n} & \underbrace{+c' + c'' + c''' \dots + c^n} & \underbrace{+z' + z'' + z''' \dots + z^n} \\
 & +\alpha & +\beta & +\gamma \\
 & -\alpha & -\beta & -\gamma
 \end{array}$$

We perceive, thus, how numerous are the mental elements actively employed in carrying us from an observation of facts to a scientific conclusion. Of course all these are not always present at the same time; they follow each other in quick succession and in groups of different combinations, but the mental operation is always complex.

In the deductive method, on the contrary, if we call the first premise  $A$ , and indicate conclusions by the smaller letters, using capitals for those same conclusions, after they also have become premises, we shall have:

$A$   
 $b$   
 $B$   
 $c$   
 $C$   
 $d.$

No matter how complex  $A, B, C$  are, even if composed of different states of consciousness, it is quite evident that this mental operation is much simpler. There are no collateral relationships, for when conclusion  $b$ , begins to act as premise  $B$ ,  $A$  can be absolutely forgotten.

It is now plain to us why men prefer deductive reasoning; being as it is, psychologically simpler and much less fatiguing than

the other. The less exercise the mind has in the one, the more it contracts the habit of using the easier process of thought, and the more incapable it becomes of using the difficult. Arrested mentation ensues. The mind stops at the relations between premises and conclusions, they being the only ideas that occupy its consciousness, all collateral associations being excluded. Little by little the mind becomes incapable of admitting other states of consciousness between the premises and the conclusions, even if such should be suggested by the sensations, because they complicate the relations. The mind shuts itself up, it sees nothing beyond the premise and the conclusion, no possible objections, nor any absolutely contrary facts. This explains why the clearest and most forcible demonstrations have no weight at all with excessively deductive minds. Harvey has shown this clearly in the history of his struggles in defence of his theory of the circulation of the blood. According to the old accepted belief, founded on a series of *à priori* reasons and on Aristotle's teaching, it was asserted that a certain opening was to be found in the heart. Harvey in many discussions and by ocular demonstration showed that this opening did not exist. This proof, which should have completely satisfied his opponents, had no effect at all upon them, so he had to be contented with asserting that though this opening did not exist in ordinary hearts, it might possibly have been found in Aristotle. Here, the reasoning was so closely confined to the premise and the deduction, that all collateral and relative ideas by which observation and logic might have modified the absolute character of the deductive inference, became impossible. The mind of these persons had been so accustomed to purely logical reasoning, which involves far less strain, that they had become incapable of any other form demanding a greater expenditure of energy. It was impossible for them to admit other elements to their habitual states of consciousness, even such as were suggested by their senses, and which, if admitted, would have led them to the true conclusion.

So we can understand why this abuse of pure logic and deductive reasoning has been in all ages a defect of thinking men, and why even to-day in spite of the tendency to experimental observa-



tion, which is continually gaining ground, we must still strive to prevent science from falling back on *à priori* proofs and pure deduction. It is because this form is more convenient and less fatiguing and ends in a mental arrest, by which the intellectual labor is simplified ; because it is a lower type of thought like the subconscious form, of which we have already spoken.

All reasoning, on the other hand, which is based on observation is far superior, more recent, less common, more complex, more fatiguing, but bears results which are vastly more extensive. More truths have been discovered in three centuries by the experimental method than could have been ascertained in a hundred centuries by mere deductions and the use of the *à priori* philosophy, which is nothing but a gigantic arrest of thought, under the sway of which mankind has lived for ages.

The analysis of the psychological process of arrested mentation explains both its genesis and its persistence.

G. FERRERO.

TURIN, ITALY.